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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,066	06/27/2001	Roland A. Wood	H0001858 (256.112US1)	4165
128	7590	03/05/2004	EXAMINER	
HONEYWELL INTERNATIONAL INC.			GABOR, OTILIA	
101 COLUMBIA ROAD			ART UNIT	
P O BOX 2245			PAPER NUMBER	
MORRISTOWN, NJ 07962-2245			2878	

DATE MAILED: 03/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/893,066	Applicant(s) WOOD, ROLAND A.	
	Examiner Otilia Gabor	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. The amendment filed 01/26/2004 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cooper (U. S. Patent 6,150,930) and further in view of Ouvrier-Buffer et al. (U. S. Patent 6,320,189).

Cooper discloses an apparatus and method to assist drivers in ascertaining the driving conditions and environment while driving at night and in low visibility conditions.

The device comprises:

- a dual wavelength focal plane detector 34 comprising:
 - o a first array of infrared sensing pixel elements 52 (see Col.4, lines 8-17, and Fig.4a)
 - o a second array of visible light pixel elements 40, 44, 48 responsive to selective colors (red, green and blue) encountered while driving an automobile such that traffic control colors are optimally sensed (see the abstract and Col.2, lines 2-7 and Figs.4a, 5,6).

Regarding claims 1, 7-10, 13, 15-18 Cooper fails to specify that the infrared pixels are bolometer pixel elements and that there is a thermally isolating space between the first and second sensor array. However this constitutes only a matter of design choice because he does not specify nor limit the type of infrared sensor pixels that can be used in his detector, and since he states that any conventionally available silicon based detector will do (see Col.52-64). Thus it would have been obvious to one of ordinary skill in the art to use the conventional pixel arrangement of Ouvrier-Bufferet. Ouvrier-Bufferet uses bolometer sensor elements 10 as the infrared pixels and a thermally isolating layer 23 that thermally isolates the thermal detection part T of the infrared bolometers 10 and the photoelectric detection P of the visible sensors 11-12 (see Figs.4, 6 and Col.2, lines 43-68).

Regarding claims 2, 3, 7, 11 the visible pixel elements are selective to the colors red, green and blue respectively, which are the colors aiding in the optimal detection of the traffic control colors. The visible pixel elements 40, 44, 48 are used to sense the selected red, green and blue visible light. The infrared pixel elements 52 are used to sense the infrared radiation incident on the detector pixels.

Regarding claim 4, the detector array is a silicon based detector (CCD), which includes a silicon substrate and silicon photosensor pixels.

Regarding claims 5, 6, 7, the device further comprises filters 39, 47, 43 for selectively passing red, green and blue light to the array of visible light pixel elements 40, 44, 48 (see Col.4, lines 17-31 and Fig.4a).

Regarding claim 9, the device further comprises a heads up display 60 coupled

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to the detector array 34 for generating a composite image based on the infrared images obtained in the IR video processor 156 and the visible images corresponding to the traffic control colors (red, green, blue) processed in the encoder 58 (see Figs.5, 6).

Regarding claim 10, in operation the device of Cooper is used for providing images on a heads up display 60 for enhancing visibility for night time drivers of vehicles, where the method of obtaining the images displayed on the display 60 comprises:

- sensing infrared radiation incident on the device while driving the vehicle
- sensing selective visible radiation (red, green, blue) corresponding to traffic control colors
- combining the infrared and visible images obtained from sensing the infrared and selective visible radiation to provide a composite image for the display 60 where the traffic control colors are displayed in color (see Col.5, lines 10-68 and Col.6, lines 1-17 and Figs.5, 6).

Regarding claims 8, 12, 13 Cooper, though discloses that commercially available silicon based detectors are used, he fails to specifically describe the arrangement of the infrared and visible pixel arrays, and as such he fails to specify that the infrared pixels are formed above the visible sensing pixels. This limitation, however, constitutes only a matter of design choice since, as clearly shown by Ouvrier-Buffer et al. in Col.2, lines 5-11, the detection of multispectral radiation is conventionally done using detector arrays sensing a first wavelength juxtaposed, adjacent or superimposed on the detector arrays sensing radiation of a second wavelength. As such, a conventional dual wavelength

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array includes the infrared sensing pixels positioned on top of the visible sensing pixels. Since any conventional detector pixel arrangement is accepted by Cooper, using the arrangement shown by Ouvrier-Bufferet would have been obvious to one of ordinary skill in the art at the time the invention was made. Ouvrier-Bufferet discloses an IR/visible dual detection array where the visible pixels 11-12 (see Figs.4, 6) are positioned beneath the infrared sensor pixels 10 and thus the arrays are vertically integrated into the monolithic silicon substrate 1. In such an arrangement, the visible light passes through the infrared sensing pixels to arrive at the visible sensors.

Regarding claim 19, Cooper discloses that the infrared image will be displayed on the display 60 in black and white (monochrome) and the visible light images in color (see Col.5, lines 10-22) as well as that various algorithms are used with matrix 56 to obtain the desired composite image. It also uses the system 130 (processor) to select the algorithm for the image based on the colored light signals with information added from the IR signal, as well as that the specific mixing of the color signals will depend upon the vehicle operating environment and the optimum display characteristics desired by the driver (see Col.5, lines 36-49).

Regarding claim 14 Cooper does not specifically disclose amber as one of the selective colors, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have amber instead of blue as one of the detected colors since that would be more helpful in identifying all the colors of the traffic light and because Cooper, by disclosing that other types of complimentary filters can be used that pass all visible wavelengths but notch out a particular color, does not limit his

invention to detecting only red, green and blue as the selective colors but allows for the detection of other desired colors as well.

Response to Arguments

4. Applicant's arguments filed 01/26/2004 have been fully considered but they are not persuasive. The main argument presented by the Applicant is that one would not be motivated to use bolometers as disclosed by Ouvrier-Buffet as short wavelength radiation detectors such as the one disclosed by Cooper, because bolometers are fundamentally different from silicon detectors because they inherently sense longer wavelengths and are not efficient in detecting short wavelengths. This assumption is flawed because, even though bolometers are conventionally used to detect longer wavelengths, it does not follow that they are used only for detecting long wavelengths, for, as clearly shown by Kern et al. (U. S. Patent 4,296,624), bolometers are very much used as efficient short wavelength detectors. Regarding the argument that there is no thermal isolation between the thermal and visible detectors, the argument is not persuasive because even though material 23 is not "space" and it's not explicitly disclosed as a thermal isolator, this limitation is inherent in the arrangement and function of two superposed detectors where the one on top is a thermal detector (bolometer), since it is well known in the field of bolometer manufacturing that without thermal isolation between the first and second detectors the reading of the detectors is erroneous. Also, in the embodiments following the one where isolating material 23 is used, a bridged bolometer is disclosed where, as is known to all in the field of thermal

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detection, the gap between the detectors is there for thermal isolation. Thus, both the thermal isolation and "space" limitation is present in Ouvrier-Buffer.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Otilia Gabor whose telephone number is 571-272-2435. The examiner can normally be reached on Monday-Friday between 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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